AMENDMENTS TO THE CLAIMS

1. (currently amended) A synthetic multimeric biopolymer comprising a plurality of monomeric units selected from the group consisting of proteins, polypeptides, nucleic acids, peptide nucleic acids, and combinations thereof;

wherein said monomeric units are covalently linked to each other;

wherein a plurality of said monomeric units of said multimeric biopolymer comprise a binding region for a ligand selected from the group consisting of a sugar, a peptide, a nucleic acid, a hormone, a vitamin, a co-factor, an anion other than a hydroxyl ion and a cation other than a hydrogen ion, and wherein said monomeric units exhibit a detectable conformational change in response to binding of the ligand to said binding region, the conformational change being detectable by NMR, X-ray crystallography or a biosensing system which detects the change in fluoresecense of a reporter fluorophore that has been attached to said monomeric unit;

B1

wherein said multimeric biopolymer exhibits a detectable change in its three-dimensional conformation when the ligand binds to one or more of the plurality of monomeric units that comprise a binding region for the ligand , and

wherein at least one of the monomeric units of said mulimeric biopolymer transmits a detectable signal selected from the group consisting of a fluorescent signal, an optical signal, an electrochemical signal, a pressure change, a dielectric constant change, a mass change, a volume change, and a temperature change in response to the change in the three-dimensional conformation of the biopolymer.

2. (currently amended) The biopolymer of claim 1 wherein the multimeric biopolymer comprises a plurality of proteins that comprise a binding region for ~~the analyte~~ a ligand and that exhibit a detectable conformational change when the ligand binds to said binding region.

3-6. (withdrawn from consideration)

7. (currently amended) The biopolymer of claim 1 wherein said biopolymer comprises an enzyme that catalyzes a biochemical reaction which results in the formation of protons or hydroxide ions when said enzyme binds to ~~said analyte~~ its substrate.

8. (currently amended) A synthetic multimeric biopolymer comprising: ~~The biopolymer of claim 1 wherein said biopolymer comprises~~

(a) a plurality of ~~protein or polypeptide that changes its~~ proteins or polypetides or both that comprise a binding region for a proton or hydroxide ion and that change their three-dimensional conformation in response to binding of ~~a~~ said proton or ~~a~~ said hydroxide ion to said binding region, and

(b) a plurality of proteins or polypeptides or both that catalyze ~~protein or polypeptide that catalyzes~~ a biochemical reaction which results in the formation of protons or hydroxide ions when said ~~protein or said polypeptide binds~~ plurality of proteins or polypeptides or both bind to ~~said analyte~~ a ligand selected from the group consisting of a sugar, a peptide, a nucleic acid, a hormone, a vitamin, a co-factor, an anion other than a hydroxyl ion and a cation other than a hydrogen ion;

B1 cont.

wherein said proteins and said polypeptides are covalently bonded to each other;

wherein said multimeric biopolymer exhibits a detectable change in its three-dimensional conformation upon binding of the ligand to its binding region , and

wherein at least one of the monomeric units of said mulimeric biopolymer transmits a detectable signal selected from the group consisting of a fluorescent signal, an optical signal, an electrochemical signal, a pressure change, a dielectric constant change, a mass change, a volume change, and a temperature change in response to the change in the three-dimensional conformation of the biopolymer.

9. (Original) The biopolymer of claim 1 wherein said biopolymer comprises a plurality of proteins or polypeptides or a plurality of aptamers.

10. (Original) The biopolymer of claim 1 wherein said biopolymer comprises from 2 to 10 monomeric units.

11. (currently canceled)

12. (currently amended) A synthetic multimeric biopolymer comprising two or more monomeric units selected from the group consisting of a protein, a polypeptide, a nucleic acid, and a peptide nucleic acid,

wherein said monomeric units are covalently linked to each other,

wherein the multimeric biopolymer comprises a plurality of monomeric units comprising a binding region for an analyte selected from the group consisting of a sugar, a peptide, a nucleic acid, a hormone, a vitamin, a co-factor, an anion and a cation, and

wherein binding of the analyte to said binding region results in a change in conformation of said monomeric unit, said conformational change in each of said monomeric units being detectable by NMR, X-ray crystallography or a biosensing system which detects the change in fluoresecense of a reporter fluorophore that has been attached to said monomeric unit,

B1 Cont.

and wherein binding of the analyte to the binding region of said monomeric units results in the formation of protons or hydroxides or the transmission of a detectable signal by at least one other monomeric unit of the multimeric polymer.

13. (Original) The biopolymer of claim 12 wherein said biopolymer comprises a protein or polypeptide that catalyzes a biochemical reaction which results in the formation of protons or hydroxides when said protein or said polypeptide binds to said analyte

14. (Original) The biopolymer of claim 12 wherein said biopolymer comprises a monomeric unit that transmits a detectable signal selected from the group consisting of a fluorescent signal, an optical signal, an electrochemical signal, a pressure change, a dielectric constant change, a mass change, a volume change, and a temperature change in response to binding of the analyte to said binding region.

15. (withdrawn from consideration)

16-37 (previously canceled)

38-40. (withdrawn from consideration)

41. (currently amended) A synthetic multimeric biopolymer comprising two or more monomeric units selected from the group consisting of proteins, polypeptides, nucleic acids, peptide nucleic acids, and combinations thereof;

wherein said monomeric units are covalently linked to each other;

wherein a plurality of said monomeric units in said biopolymer comprise a binding region for an analyte selected from the group consisting of a sugar, a protein, a peptide, a nucleic acid, a hormone, a vitamin, a co-factor, an anion and a cation,

wherein each of the monomeric units that comprise a binding region for an analyte exhibits a change its three-dimensional conformation in response to binding of the analyte to said monomeric unit, said conformational change in each of said monomeric units being detectable by NMR, X-ray crystallography or a biosensing system which detects the change in fluoresecense of a reporter fluorophore that has been attached to said monomeric unit ; and

B1 cont.

wherein said multimeric biopolymer exhibits a greater change in its three-dimensional conformation in response to binding of the analyte to said binding region of said monomeric units than the conformational change that occurs in an individual monomeric unit as a result of binding of an analyte to said individual monomeric unit.

42. (previously added) The synthetic multimeric biopolymer of claim 1 wherein said monomeric units are attached to each other by peptide bonds.

43. (previously added) The synthetic multimeric biopolymer of claim 1 wherein said monomeric units are chemically cross-linked to each other.

44. (previously added) The synthetic multimeric biopolymer of claim 12 wherein said monomeric units are linked to each other by peptide bonds.

45. (previously added) The synthetic multimeric biopolymer of claim 12 wherein said monomeric units are chemically cross-linked to each other.

46. (previously added) The synthetic multimeric biopolymer of claim 41 wherein said monomeric units are linked to each other by peptide bonds.

47. (previously added) The synthetic multimeric biopolymer of claim 41 wherein said monomeric units are chemically cross-linked to each other.

48 and 49 (currently canceled)

50. (previously added) The synthetic multimeric biopolymer of claim 1 wherein the change in conformation of the biopolymer is reversible.

51. (previously added) The synthetic multimeric biopolymer of claim 41 wherein the change in conformation of the biopolymer is reversible.

B1
Cont.

52. (currently added) The biopolymer of claim 1 wherein the biopolymer comprises a plurality of proteins or polypeptides having a binding region for a ligand, and wherein each of said proteins or polypeptides has a reporter fluorophore conjugated thereto.

53. (currently added) The biopolymer of claim 52 and wherein the fluorescence given off by said biopolymer when the ligand binds to a plurality of said proteins or polypeptides is greater than additive.

54. (currently added) The biopolymer of claim 41 wherein the biopolymer comprises a plurality of proteins or polypeptides having a binding region for an analyte, and wherein each of said proteins or polypeptides has a fluorophore conjugated thereto.

55. (currently added) The biopolymer of claim 54 wherein the fluorescence given off by said biopolymer when the ligand binds to a plurality of said proteins or polypeptides is greater than additive.

56. (currently added) The biopolymer of claim 1 wherein the biopolymer comprises a plurality of proteins or polypeptides having a binding region for a sugar or a cation other than a hydrogen ion.

B1 CON'T.

57. (currently added) The biopolymer of claim 1 wherein the biopolymer comprises a plurality of proteins or polypeptides having a binding region for an oxyanion.